

NOTES ON GRASSES

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The following notes have accumulated during recent years. They should be taken as notes and not as revisions of the groups concerned. Retirement has given me the time and opportunity to prepare them for publication.

Parvifolia Group of Panicum

First glume broad, $2/3$ the length of the spikelet.

Spikelets 2 mm. or more long.

First glume 5-nerved.

Blades glabrous or nearly so.

Blades narrow..... 1. P. carannasense

Blades broad..... 2. P. caaguense

Blades pilose on both surfaces.

3. P. errabundum

First glume 3-nerved.

Blades mostly about 3 mm. wide, linear, stiffly spreading, glabrous.. 4. P. wettsteinii

Blades mostly 4-5 mm. wide, shorter, pilose on both surfaces. 5. P. pseudisachne

Spikelets less than 2 mm. long.

Spikelets 1.7-1.8 mm. long.

Plants erect.

Plants annual.

6. P. kaietukense

Plants perennial from rhizomes.

7. P. savannarum

Plants decumbent-spreading, without rhizomes; blades cordate or subcordate, pubescent.

Blades 1-2 cm. wide, pubescent.

8. P. semitectum

Blades less than 1 cm. long, glabrous.

9. P. helobium

Spikelets 1.2-1.5 mm. long.

Culms mostly erect, at least not decumbent-spreading.

Culms stout; blades more than 5 mm. wide.

Blades mostly not over 7 mm. wide, not clasping. 10. P. cyanescens

Blades as much as 15 mm. wide, the base of the blades conspicuously clasping.

11. P. nervosum

Culms slender, the blades distant.

Blades narrow, at least some of them involute; spikelets 1.6 mm. long.

12. P. orinocanum

Blades broader, not at all involute;
spikelets 1.4 mm. long.

13. P. vinnulum

Culms slender, decumbent or creeping.

Blades 1-3 cm. long, usually spreading or
reflexed, glabrous; culms nearly simple.

14. P. parvifolium

Blades much longer, pubescent or pilose on
both surfaces; culms with short dense
branches from the upper nodes.

15. P. egleri

First glume relatively narrow, usually acute or sub-
acute, rarely more than half the length of the
spikelet.

Spikelets pilose.

Spikelets 0.8-1 mm. long.

Ligule arcuate; culms about 30 cm. tall; blades
appressed, 5 mm. wide.

16. P. subinclusum

Ligule straight; culms not more than 20 cm.
tall, usually much less; blades spreading,
not over 2 mm. wide.

Spikelets 0.8 mm. long.

Culms sparingly branching, not more than
10 cm. tall.....

17. P. obovatum

Culms freely branching from all the nodes.

18. P. froesii

Spikelets 1 mm. long. Panicles small,
usually partly enclosed in the sheath;
spikelets on short stiff pedicels.

19. P. siccanum

Spikelets 1.2-1.4 mm. long.

Ligule straight.

Culms creeping, long and tangled.

20. P. fonticulum

Culms erect or decumbent, not creeping.

Plants annual.....

21. P. tamayonis

Ligule arcuate.

Annual; culms tufted, erect or spreading at
the base.

Blades linear, not more than 1.5 mm. wide.

22. P. gracilissimum

Blades subcordate, ovate or ovate-
lanceolate, up to 4 mm. wide.

First glume narrow, somewhat remote.

23. P. graniticum

First glume broad, not remote.

24. P. pandum

Perennial?; culms decumbent-spreading or
creeping.

Culms very slender, widely creeping,
becoming tangled.

25. P. yavitaense

Culms relatively slender, decumbent at the base only.

Panicles small, rather dense, 1-2 cm. long..... 26. P. petrense

Panicles very open, up to 8 cm. long.

Culms nearly simple; spikelets 1.1 mm. long..... 27. P. mauryi

Culms freely branching; spikelets 1.3-1.4 mm. long.

28. P. goeldii

Spikelets glabrous.

Spikelets 0.9-1 mm. long.

Blades involute, soft and fine; culms decumbent-spreading, branching.

29. P. petilum

Blades flat.

Plants annual.

Culms with short branches from the node; panicles to 2 cm. long, about as wide as long..... 30. P. polycomum

Culms simple or with one or two branches; panicles as much as 8 cm. long, much longer than wide.

31. P. arctum

Plants perennial.

Ligule arcuate; blades elliptic-lanceolate.

Culms erect or ascending; panicles relatively larger, exserted.

Foliage glabrous or nearly so.

32. P. granuliferum

Foliage conspicuously pilose or hispid, bluish-glaucous.

33. P. spissifolium

Culms widely creeping; panicles small, usually partly enclosed in the sheath.

34. P. kuhlmanni

Ligule straight; blades linear.

35. P. kappleri

Spikelets 1.2-1.4 mm. long.

Culms very slender, creeping, becoming tangled.

36. P. blackii

Culms erect or decumbent at the base, not creeping.

Plants annual.

Lateral spikelets with pedicels as long as or shorter than the spikelets.

23. P. graniticum

Lateral spikelets with pedicels much longer than the spikelets.

37. P. angulosum

Plants perennial.

Ligule straight. Blades about 1 cm. long, crowded..... 38. P. densifolium

Ligule arcuate.

Blades linear, 4-5 cm. long, 2 mm. wide.

39. P. micranthum

Blades elliptic, 4-5 mm. wide.

Blades thin, lax, spreading, sparsely pilose or nearly glabrous; spikelets pointed, the second glume as long as the fruit.

40. P. rivale

Blades firm, appressed, glaucous, glabrous; second glume distinctly shorter than the fruit.

41. P. politii

1. PANICUM CARANNASENSE Mez, Notizbl. Bot. Gart. Berlin 7: 73. 1917.
Type: Brazil: Minas Gerais, near Carannas, Sellow 204.
2. PANICUM CAAGUENSE Henr. Med. Rijks. Herb. Leiden 47: 2. 1922.
Type: Paraguay: Caaguayu, Balanse 22.
3. PANICUM ERRABUNDUM Hitchc. Contr. U. S. Nat. Herb. 22. 494. f. 85. 1922.
Type: British Guiana: Parika, Hitchcock 16817.
4. PANICUM WETTSTEINII Hack. Ergeb. Bot. Exped. Akad. Wiss. Sudbras. 12. 1906; Denkschr. Akad. Wiss. Math. Naturw. (Wien) 79: 73. 1908.
P. rectissimum Mez, Notizbl. Bot. Gart. Berlin 7: 73. 1917. Brazil: Glaziou 17955.
Type: Brazil: São Paulo, near S. Bernardo, Wettstein & Schiffner.
5. PANICUM PSEUDISACHNE Mez, Notizbl. Bot. Gart. Berlin 7: 71. 1917.
Type: Brazil: Glaziou 13330.
6. PANICUM KAIETUKENSE Tutin, Journ. Bot. Brit. & For. 72: 340. f. 11. 1934.
Type: British Guiana: "Kaietuk" savanna, Potaro River, Tutin 688.
7. PANICUM SAVANNARUM Soderstrom, Mem. N. Y. Bot. Gard. 12(3): 2. 1965.
Type: British Guiana: Essequibo District: Kaieteur Plateau, Cowan & Soderstrom 2195.
8. PANICUM SEMITECTUM Swallen, nom. nov.
P. emergens Doell in Mart. Fl. Bras. 2(2): 269. 1877. Not P. emergens Hochst. Flora 38. 196. 1855.
Type: Brazil: São Paulo, Riedel 1961.

9. *PANICUM HELOBIMUM* Mez ex Ekman, Med. Rijks. Herb. Leiden. 40: 52. 1921.
Type: Argentina: Misiones: Loreto, Ekman 650.
10. *PANICUM CYANESCENS* Nees in Trin. Gram. Pan. 202. 1826; Agrost. Braz. 220. 1829.
Type: "V. spp, Brazil. (Link. Mertens)."
11. *PANICUM NERVOSUM* Lam. Encycl. 4: 747. 1798.
Type: French Guiana: Isle de Cayenne, Desfontaines.
12. *PANICUM ORINOCANUM* Lucas, Journ. Washington Acad. Sci. 32: 164. f. 9. 1942.
Type: Venezuela: Alto Orinoco, Puerto Ayacucho, Ll. Williams 13090.
13. *PANICUM VINNULUM* Swallen, sp. nov.
Culmi graciles, erecti, 40-50 cm. alti; ligula arcuata 0.3 mm. longa; laminae anguste adscendentes vel appressae, 2.5-4.3 cm. longae, 2.5-3 mm. latae, acuminatae; spiculae 1.3-1.4 mm. longae, longepedicellatae; gluma prima spicula 1/3-1/4 brevior.
Perennial; culms slender, erect from a rhizome-like base, 45-50 cm. tall, glabrous; sheaths shorter than the internodes, glabrous; ligule arcuate, 0.3 mm. long; blades narrowly ascending or appressed, 2.5-4.3 cm. long, 2.5-3 mm. wide, acuminate, glabrous; panicles 5-6 cm. long, 4 cm. wide with ascending branches about 3 cm. long; spikelets purple, 1.3-1.4 mm. long, on long slender pedicels, glabrous; first glume 2/3-3/4 as long as the spikelet, broad, rounded or subobtuse, 3-nerved; second glume and sterile lemma equal, just covering the fruit, 5-nerved, the sterile lemma with a staminate flower; fruit white, shining.
Type in the U. S. National Herbarium, No. 1961194, collected in banhado, Estação Experimental, Ponta Grossa, Paraná, Brazil, January 31, 1946, by Jason R. Swallen (No. 8374).
14. *PANICUM PARVIFOLIUM* Lam. Tabl. Encycl. 1: 173. 1791.
Type: "Ex Amer. merid. communis. D. Richard."
15. *PANICUM EGLERI* Swallen, sp. nov.
Culmi erecti vel decumbentes 30-40 cm. alti, ramosi; ligula brevissima, arcuata; laminae 4-4.5 cm. longae, 4-5 mm. latae, adscendentes, pilosae vel glabrae; spiculae 1.5 mm. longae, glabrae, pedicellis brevis rigide divergentibus; gluma prima spicula 1/3 brevior.
Perennial; culms erect or decumbent, reddish, 30-40 cm. long, branching; sheaths of the main culm

about as long as or shorter than the internodes, shorter than the internodes on the branches, papillose-pilose especially on the margins and the lower part, sometimes over the back; ligule arcuate, very short; blades of the main culm 4-5.5 cm. long, 4-5 mm. wide, ascending, densely pilose to nearly glabrous on both surfaces, the leaves of the branches reduced; panicles shortly exserted, 2-4 cm. long, with a few widely spreading solitary branches; spikelets 1.5 mm. long on relatively short, stiffly spreading pedicels, glabrous; first glume $\frac{2}{3}$ the length of the spikelet, broad, triangular, subacute, 3-nerved; second glume and sterile lemma equal, just enclosing the fruit.

Type in the U. S. National Herbarium, No. 2307286, collected at Rio Cururu, Tapajós, Pará, Brazil, July 17, 1959, by W. A. Egler (No. 921).

16. PANICUM SUBINCLUSUM Swallen, Mem. N. Y. Bot. Gard. 9: 260. 1957.

Type: Venezuela: Amazonas: Rio Atabapo, Bassett Maguire 29271.

17. PANICUM OBOVATUM Doell in Mart. Fl. Bras. 2(2): 256. 1877.

Type: Brazil: Amazonas: S. Gabriel, Spruce 2341.

18. PANICUM FROESII Swallen, sp. nov.

Culmi graciles, erecti vel adscendentes, ramossissimi, 10-20 cm. alti; ligula ca. 0.1 mm. longa; laminae 1-2 cm. longae, 1-2 mm. latae; spiculae 0.8 mm. longae, obovatae, papilloso-hispidae; gluma prima spicula $\frac{1}{2}$ brevior, late acuta; fructus albidus 0.6 mm. longus.

Annual; culms very slender, erect or ascending, more or less geniculate, branching at most of the nodes, 10-20 cm. tall, the nodes with a few long hairs; sheaths mostly shorter than the internodes, pilose, especially on the margins; ligule very short, about 0.1 mm. long; blades 1-2 cm. long, 1-2 mm. wide, sparsely pilose; panicles 2-3.5 cm. long, about as wide, with spreading few-flowered branches; spikelets 0.8 mm. long, obovate, pointed, narrowed to the base, papillose-hispid; first glume about half as long as the spikelet, broadly acute; second glume and sterile lemma equal, slightly pointed beyond the fruit, strongly 5-nerved, the lemma empty; fruit white, about 0.6 mm. long.

Type in the U. S. National Herbarium, No. 1910784, collected on sandy river banks, Irauassú, Aiary, Içana, Amazonas, Brazil, November 6, 1945, by Ricardo de Lemas Fróes (No. 21383).

Colombia: Vaupes: Río Vaupes: Circasia, Schultes & Cabrera 19698; Cerro Circasia, Schultes 5843.
 Venezuela: Territory Amazonas: Maroa, Maguire, Wurdack & Keith 41702; Pimichin-Yavita trail, Maguire, Wurdack & Keith 41792; between Maroa and Sabanita, Maguire, Wurdack & Bunting 36423. Brazil: Amazonas: Tunuí, Lutzburg 22946; Territory Rio Branco: Campos Gerais, region of Caracarahy, Fróes 23618.

19. PANICUM SICCANUM Trin. Linnea 10: 298. 1836.

Type: Brazil: Colares, Rio Amazonas, Poeppig.

20. PANICUM FONTICOLUM Swallen, Mem. N. Y. Bot. Gard. 9: 260. 1957.

Type: Venezuela: Amazonas: Cerro Duida, Maguire, Cowan & Wurdack 29636.

21. PANICUM TAMAYONIS Lucas, Bol. Soc. Venez. Cienc. Nat. 15: 24 f. 17. 1953.

Type: Venezuela: Bolívar: Gran Sabana, Tamayo 3061.

22. PANICUM GRACILISSIMUM Swallen, Mem. N. Y. Bot. Gard. 9: 259. 1957.

Type: Venezuela: Amazonas: Puerto Ayacucho, Maguire, Wurdack & Bunting 36043.

23. PANICUM GRANITICUM Swallen, sp. nov.

Culmi erecti vel adscendentes, ramosi, 9-15 cm. alti; ligula arcuata 0.3 mm. longa; laminae 1-1.5 cm. longae, 2-4 mm. latae, longipilosae; spiculae 1.2-1.3 mm. longae, glabrae vel sparse pilosae, pedicellis brevis rigidis; gluma angusta, acuta, spicula 1/3 brevior, paula remota.

Annual; culms erect or ascending, freely branching, 9-15 cm. tall, the nodes sparsely bearded, the hairs long; sheaths much shorter than the internodes, the lower ones densely long-pilose, the uppermost glabrous or pilose only on the margins; ligule arcuate, 0.3 mm. long; blades 1-1.5 cm. long, 2-4 mm. wide, somewhat cordate, spreading more or less long-pilose on both surfaces; panicles 2-5 cm. long, 2-3 cm. wide with a few stiffly ascending to reflexed branches; spikelets 1.2-1.3 mm. long, glabrous to sparsely pilose, on relatively short stiff pedicels, the lateral ones shorter than the spikelets; first glume narrow, acute, 1-3-nerved, about 2/3 the length of the spikelet, somewhat remote; second glume and sterile lemma acute, 5-nerved, pointed beyond the fruit; fruit 1 mm. long, obovate, acute, obscurely papillose or scabrous, yellowish.

Type in the U. S. National Herbarium, No. 2434514, collected on exposed granite, Iramakipang Summit,

Kanuku Mountains, British Guiana, altitude 3500 feet, August 18, 1963, by R. Goodland & P. F. Maycock (No. 453).

24. PANICUM PANDUM Swallen, Brittonia 3: 150. 1939.
Type: Venezuela: Mount Auyan-Tepui, Tate 1287.

25. PANICUM YAVITAENSE Swallen, sp. nov.

Culmi graciles, ramosi, implicati, 30 cm. longi, nodis barbatis; ligula arcuata, brevissima; laminae 2.5-5 cm. longae, 2-6 mm. latae, longipilosae; spiculae ellipticae 1.2 mm. longae, pedicellis longis capillaribus hispidis; gluma prima spicula 1/2 brevior.

Annual; culms slender, branching, forming tangled masses, as much as 30 cm. long, the nodes bearded; sheaths much shorter than the internodes, long-pilose; ligule arcuate, very short; blades 2.5-5 cm. long, 2-6 mm. wide, thin, long-pilose; panicles 7 cm. long, about as wide, with ascending to spreading slender pilose branches; spikelets elliptic, pointed, 1.2 mm. long on long slender capillary hispid pedicels; first glume 1/2 as long as the spikelet, narrow, acutish, 3-nerved; second glume and sterile lemma equal or the glume a little shorter, just covering the fruit or slightly pointed beyond it; fruit 0.9 mm. long, white, shining.

Type in the U. S. National Herbarium, No. 2307253, collected along Yavita-Pimichin trail near Yavita, Territory Amazonas, Venezuela, June 10, 1959, by John J. Wurdack & L. S. Adderly (No. 42910).

This species was also collected at Yurupari, Vaupes, Colombia, by J. Cuatrecasas No. 6968.

26. PANICUM PETRENSE Swallen, Mem. N. Y. Bot. Gard. 9: 259. 1957.

Type: Venezuela: Amazonas: Río Atabapo, Bassett Maguire 29259.

27. PANICUM MAURYI Swallen, Fieldiana 28: 26. 1951.
P. micranthus var. hirtum Maury, Journ. de Bot. 3: 162. 1889.

Type: "Cerro Carichaud, savane seche, J. Chaff., n. 284."

28. PANICUM GOELDII Swallen, sp. nov.

Culmi basi decumbentes, ramosi, ca. 20 cm. alti, nodis barbatis; ligula arcuata brevissima; laminae 1.5-2.8 cm. longae, 1.5-4 mm. latae, appressae vel adscendentes, sparse pilosae; spiculae obovatae 1.3-1.4 mm. longae, pilosae; gluma prima spicula 1/2 brevior.

Perennial; culms decumbent at the base, freely

branching, about 20 cm. tall, glabrous, bearded at the nodes; sheaths mostly shorter than the internodes, hispid or papillose-hispid especially on the margins; ligule arcuate, very short; blades 1.5-2.8 cm. long, 1.5-4 mm. wide (mostly 3-4 mm.), appressed or ascending, sparsely pilose on both surfaces, with a few papillose based hairs on the margins at the rounded base; panicles up to 6 cm. long, with ascending branches about 3 cm. long; spikelets obovate, 1.3-1.4 mm. long, pilose; first glume broadly triangular, about half as long as the spikelet; second glume and sterile lemma equal or the glume a little shorter; fruit smooth, shining, pale yellowish.

Type in the U. S. National Herbarium, No. 1039731, collected on Estate Gavinho, Marajó Island, Pará, Brazil, June, 1918, by Andre Goeldi (No. 222).

Additional material examined: Surinam: One kilometer NW. of Viltzberg, Coppene River, Schulz & Donselaar 10555, 10559.

29. PANICUM PETILUM Swallen, sp. nov.

Culmi gracillimi basi decumbentes, adscendentes, ramosissimi, 30-40 cm. longi; ligula 1 mm. longa; laminae 1.5-2.5 cm. longae, involutae, adscendentes vel reflexae; spiculae 1 mm. longae, glabrae; gluma prima spicula 1/2 brevior, subobtusata.

Perennial; culms very slender, decumbent spreading at the base, ascending, 30-40 cm. long, freely branching; sheaths shorter than the internodes on the main culm, much longer than the internodes on the branches, glabrous; ligule less than 0.1 mm. long, glabrous; blades 1.5-2.5 cm. long, involute, ascending to reflexed; panicle 1.5-3 cm. long, few-flowered, the branches spreading, glabrous; spikelets 1 mm. long, glabrous; first glume half as long as the spikelet, blunt, 3-nerved; second glume and sterile lemma 5-nerved, blunt, as long as the spikelet, or the glume a little shorter; fruit white, minutely papillose-roughened.

Type in the U. S. National Herbarium, No. 1910820, collected in wet pockets on side of mountain among dense mosses, "Cerro Canejen," Department Vaupes, Colombia, July 24, 1943, by Carl O. Grassl (No. 10009).

30. PANICUM POLYCOMUM Trin. Mem. Acad. St. Petersburg.

VI. Sci, Nat. 1: 306. 1834.

Type: "V. spp. Guian."

31. PANICUM ARCTUM Swallen, Bull. Torrey Club 75: 87. 1948.

Type: Surinam: Tafelburg, Maguire 24214.

32. PANICUM GRANULIFERUM H.B.K. Nov. Gen. et Sp. 1: 105. 1815.
Type: Venezuela: "Crescit in ripa fluminum Apure, Atabapo et Tuamini (Prov. Novae Guayanae)."
33. PANICUM SPISSIFOLIUM Swallen, Bull. Torrey Club 75: 86. 1948.
Type: British Guiana: Kaieteur Savanna, Maguire & Fanshawe 23097.
34. PANICUM KUHLMANNI Swallen, sp. nov.
Culmi 10-20 cm. longi, graciles, ramosi, basi decumbentes; ligula brevissima, recta; laminae 1-2.5 cm. longae, 1-3 mm. latae, appressae; spiculae obovatae, 0.9-1 mm. longae, glabrae, pedicellis brevibus, rigidis, glabris; gluma prima enervis, spicula 1/2 brevior.
Annual; culms 10-20 cm. long or longer, slender, freely branching, decumbent spreading, forming a tangled mat, glabrous; sheaths usually much shorter than the internodes, glabrous or with a few hairs on the margins; ligule very short, straight; blades 1-2.5 cm. long, 1-3 mm. wide, appressed, glabrous; panicles partly enclosed in the sheath, 1-2.5 cm. long, about 1 cm. wide with a few ascending branches, glabrous throughout; spikelets obovate, 0.9-1 mm. long, on relatively short stiff pedicels, glabrous; first glume apparently nerveless, less than half the length of the spikelet; second glume and sterile lemma equal, 5-nerved, just covering the white fruit.
Type in the U. S. National Herbarium, No. 1255681, collected on Campo do Pute between Araão Melgaes and Pimento Bueno, Mato Grosso, Brazil, June 1918, by Kuhlmann (No. 1778).
35. PANICUM KAPPLERI Steud. Syn. Pl. Glum. 1: 90. 1854.
Type: Surinam: Kappler 477.
36. PANICUM BLACKII Swallen, sp. nov.
Culmi gracillimi, decumbentes, ca. 30 cm. longi; laminae 1-1.5 cm. longae, 1.5-2 mm. latae, adscendentes, villosae; ligula brevissima, recta; spiculae 1.3-1.4 mm. longae, glabrae; gluma prima spicula 1/2 brevior, acuta, 3-nervis.
Perennial?; culms very slender, decumbent-spreading, about 30 cm. long, glabrous; sheaths usually much shorter than the internodes, glabrous; ligule very short, straight; blades 1-1.5 cm. long, 1.5-2 mm. wide, stiffly ascending, blunt, villous on both surfaces, with rather prominent white margins; panicles 3-4 cm. long with few to several slender, ascending, few-flowered branches; spikelets 1.3-1.4 mm. long,

glabrous; first glume 1/2 as long as the spikelet, acute, 3-nerved; second glume and sterile lemma equal, just covering the fruit, obtuse, the sterile lemma containing a well-developed staminate flower; fruit white.

Type in the U. S. National Herbarium, No. 2238102, collected on campo, Fazenda Capela, Territory of Rio Branco, Brazil, November 7, 1951, by George Black (No. 51-14071).

37. PANICUM ANGULOSUM Swallen, sp. nov.

Culmi graciles, erecti vel divergentes, ramosi, geniculati, usque ad 22 cm. longi; ligula arcuata, 0.6 mm. longa, glabra; laminae 1.5-3.4 cm. longae, usque ad 3 mm. latae, planae, sparse pilosae; spiculae 1.4 mm. longae; glabrae vel \pm scabrae, purpurascens; gluma prima acuta, spicula 1/2 brevior.

Annual; culms slender, erect to spreading, geniculate and branching at the nodes, as much as 22 cm. long, glabrous; sheaths much shorter than the internodes, glabrous or sparsely pilose; ligule arcuate, 0.6 mm. long, glabrous; blades 1.5-3.4 cm. long, as much as 3 mm. wide, flat, glabrous to sparsely pilose; panicles up to 8 cm. long, 11 cm. wide, with a few solitary widely spreading to reflexed branches, rather few-flowered, glabrous throughout; spikelets 1.4 mm. long, glabrous or somewhat scabrous, purple; first glume acute, 3-nerved, half as long as the spikelet; second glume and sterile lemma equal or the glume slightly shorter than the fruit, rounded, 5-nerved; fruit as long as the spikelet, rather thin, whitish.

Type in the U. S. National Herbarium, No. 2380390, collected in sandy rocky soil in full sun near brink of Kaieteur Fall, British Guiana, March 7, 1962, by R. S. Cowan & T. R. Soderstrom (No. 2064).

Additional specimens referred to this species: Venezuela: 105 km. from El Dorado to Santa Elena, Estado Bolívar, Foldats 2786. Brazil: Territory of Amapá, Rio Araguari, Pires, Rodrigues & Irvine 51139.

38. PANICUM DENSIFOLIUM Swallen, Fieldiana 28: 25. 1951.

Type: Venezuela: Amazonas: Esmeraldo (Cerro Duida), Steyermark 57755.

39. PANICUM MICRANTHUM H.B.K. Nov. Gen. et Sp. 1: 105. 1815.

Type: Venezuela: "Caracasana.....juxta Villa de Cura.....", Humboldt & Bonpland.

40. PANICUM RIVALE Swallen, Bull. Torrey Club 75: 87. 1948.

Type: Surinam: Tafelberg, Bassett Maguire 24732.

41. PANICUM POLITII Swallen, sp. nov.

Culmi erecti vel decumbentes, ramosi, ca. 30 cm. alti, glabri; ligula brevissima, arcuata; laminae adscendentes vel appressae, 1.5-4 cm. longae, 2-4 mm. latae, glabrae, vel sparse pilosae; spiculae 1.3-1.4 mm. longae, glabrae, purpurascens, pedicellis ca. 1 cm. longis; gluma prima spicula 1/2 brevior, acuta, 1-nervis.

Perennial; culms erect or decumbent at the base, about 30 cm. tall, branching, glabrous; sheaths usually about half as long as the internodes, glabrous; ligule arcuate, very short; blades ascending or appressed, 1.5-4 cm. long, 2-4 mm. wide, glabrous or sparsely pilose above the ligule; panicles 4-8 cm. long, the slender solitary branches widely ascending or spreading, few-flowered; spikelets 1.3-1.4 mm. long, glabrous, tinged with purple, on pedicels approximately 1 cm. long; first glume half as long as the spikelet, acutish, 1-nerved; second glume obtuse, about 1/3 shorter than the fruit; sterile lemma slightly longer than the fruit, acute; fruit shining, yellowish brown.

Type in the U. S. National Herbarium, No. 2040162, collected on Santa Rosa Savana, Río Orinoco, Venezuela, November 17, 1948, by Bassett Maguire, H. R. Kunhardt, Jr. & Louis Politi (No. 27306).

Additional material examined: Venezuela: Territory Amazonas: Esmeraldo Ridge, Maguire & Wurdack; Santa Barbara Savanna, junction of Rios Ventuari and Orinoco, Maguire, Cowan & Wurdack 32044. Brazil: Pará: Rio Cumina, Sampaio 5334.

New Species of Panicum

Fasciculata

PANICUM OBLITUM Swallen, sp. nov.

Culmi erecti basi decumbentes, 20-35 cm. alti, dense villosi; laminae 3-8 cm. longae, 5-8 mm. latae, velutinosae; paniculae 6-9 cm. longae, 1-1.5 cm. latae, ramis adscendentibus vel appressis; spiculae 2.4-2.5 mm. longae, inflatae, glabrae; gluma prima spicula 1/2 brevior, acuta vel obtusa; fructus minute rugosus.

Annual; culms erect, or decumbent at the base, 20-35 cm. tall, densely pilose; sheaths a little shorter than the internodes, densely pilose like the culms; blades 3-8 cm. long, 5-8 mm. wide, thickly covered with dense hairs, velvety; panicles 6-9 cm. long, 1-1.5 cm. wide, the branches narrowly ascending or appressed, densely flowered, the main axis, branches

and pedicels long-pilose; spikelets 2.4-2.5 mm. long, inflated, glabrous; first glume almost half as long as the spikelet, acute or obtuse, broad and clasping; second glume and sterile lemma equal, just covering the fruit, 5-nerved, inflated, abruptly acute, whitish, the cells visible, the lemma containing a very well developed palea; fruit slightly ovate, 1.3 mm. wide, apiculate, yellowish, finely cross-wrinkled.

Type in the U. S. National Herbarium, No. 2181160, collected along "Carretera Central," between Chosica and Chicla, Province Huarochiri, Department Lima, Peru, March 24, 1952, by Ramón Ferreyra & P. C. Hutchison.

Pyricularia

PANICUM ICHUNENSE Swallen, sp. nov.

Culmi graciles, decumbentes, ramosi, usque ad 20 cm. longi; ligula arcuata, 0.8-1 mm. longa; laminae 2-4 cm. longae, 3-10 mm. latae, sparse longi-pilose; paniculae 2.5-6 cm. longae ramis patentibus vel reflexis usque ad 4.5 cm. longis; spiculae 2-2.2 mm. longae, attenuatae, pilosae; gluma prima spicula 1/5-1/3 brevior, acuta.

Annual; culms slender, decumbent spreading, freely branching, the branches erect, as much as 20 cm. long, glabrous or with a few long hairs at the nodes; sheaths all shorter than the internodes, very sparsely pilose with long hairs; ligule arcuate, 0.8-1 mm. long; blades 2-4 cm. long, 3-10 mm. wide, very thin, very sparsely long-pilose; panicles 2.5-6 cm. long, with widely spreading or reflexed few-flowered branches as much as 4.5 cm. long; spikelet 2-2.2 mm. long, attenuate at the base, pilose; first glume 2/3-4/5 as long as the spikelet, narrow, 3-nerved, acute; second glume and sterile lemma equal, pointed beyond the fruit, 5-nerved; fruit 1.7 mm. long, elliptic, acute, pale, finely papillose-roughened.

Type in the U. S. National Herbarium, No. 2382348, collected near waterfall spray, Salto Maria Espuma, Río Ichun, Sierra Ichun, tributary Río Paragua, Lat. 4° 46', Long. 63° 18', state of Bolívar, Venezuela, December 28, 1961, by Julian A. Steyermark (No. 90359). Also collected to the north of Salto Maria Espuma, Steyermark 90292.

Laxa

PANICUM MANACALENSIS Swallen, sp. nov.

Culmi erecti, firmi, glabri, 125 cm. alti; ligula arcuata, 0.2 mm. longa, minute ciliata; laminae 25-40 cm. longae, 6-10 mm. latae, attenuatae, glabrae; paniculae 35 cm. longae, pyramidales, ramis usque ad

12 cm. longis, ramosissimis; spiculae 1.4-1.5 mm. longae, ovatae, glabrae; gluma prima lata, spicula 1/2 brevior.

Perennial; culms erect, somewhat geniculate and rooting at the lower nodes, firm, glabrous, 125 cm. tall; sheaths about as long as the internodes, loose, glabrous; ligule arcuate, about 0.2 mm. long, minutely ciliate; blades 25-40 cm. long, 6-10 mm. wide, attenuate, glabrous on both surfaces; panicle 35 cm. long, pyramidal, the branches in fascicles of one or two, the lower fascicles 5 cm. distant becoming closer upward, flexuous, as much as 12 cm. long with numerous branchlets along them; spikelets 1.4-1.5 mm. long, ovate, pointed, glabrous, appressed to the branches; first glume broad, clasping, 1-3-nerved, about 1/2 as long as the spikelet; second glume and sterile lemma equal, the glume 5-nerved, the lemma 3-nerved, slightly pointed beyond the fruit; fruit 1.2 mm. long, elliptic, pointed, yellowish, smooth and shining.

Type in the U. S. National Herbarium, No. 2307255, collected in drowned margins of Río Atabapo at Manacal, Territory of Amazonas, Venezuela, June 19, 1954, by John J. Wurdack & L. S. Adderlay (No. 42986).

This species resembles Panicum hylaeium Mez, but the blades are not at all cordate and the spikelets are pointed rather than blunt.

Stolonifera

PANICUM PIRINEOSENSE Swallen, sp. nov.

Culmi erecti, 1.3 m. alti, rhizomatosi; vaginae internodiis multo breviores, inferiores dense pubescentes, superiores glabrae; laminae 12-18 cm. longae, 1.2-2 cm. latae, pubescentes; inflorescentia 21 cm. longa, 5 cm. lata, racemis 40, inferioribus 3 cm. longis basi dense pubescentibus; spiculae 3.2 mm. longae brevipedicellatae; gluma prima triangularis, 3-5-nervis, spicula 1/2 brevior, in parte superiore pubescens; lemma sterile 2-glandulis 1/4 infra extremitatem praeditum.

Perennial; culms erect 1.3 m. high, apparently from short rhizomes, with densely pubescent cataphylls; sheaths mostly much shorter than the internodes, the lower ones densely pubescent, the upper glabrous, the collar area densely pubescent; ligule ciliate, about 1 mm. long; blades 12-18 cm. long, 1.2-2 cm. wide, acuminate, finely pubescent on both surfaces to nearly glabrous; inflorescence 21 cm. long, about 5 cm. wide, tapering to the summit, composed of about 40 spreading one-sided racemes, the lower ones 3 cm. long, floriferous to the base, the base densely pubescent; spikelets 3.2 mm. long, short-pedicellate in two rows on one side of the rhachis,

the second of a pair of spikelets usually abortive; first glume triangular, acute, 3-5-nerved, about half as long as the spikelet, irregularly pubescent or pilose in the upper half; second glume and sterile lemma equal, 5-7-nerved, bearing from or below the middle on the margins coarse spreading hairs 1 mm. long, pubescent or pilose across the back, the lemma bearing 2 glands about 1/4 below the summit; fruit 1.7 mm. long, yellowish, smooth and shining.

Type in the U. S. National Herbarium, No. 2236507, collected between rocks, at Pirineos, Goiás, Brazil, October 18, 1956, by Amaro Macedo (No. 4805).

Penicillata

PANICUM LONGIPEDICELLATUM Swallen, sp. nov.

Culmi basi decumbentes 1.6 m. longi, glabri; ligula 1 mm. longa, firma, hispido-ciliata, 2 mm. longa; laminae planae 35-41 cm. longae, 2.3-3.6 mm. latae, glabrae, marginibus valde scabris; panícula 40 cm. longa; spiculae 4-4.5 mm. longae, pedicellis 1-4 cm. longis; gluma prima spicula paulo longior vel brevior, 5-nervis, extremitate pilis longis praedita.

Culms erect from a long decumbent base, 1.6 m. long, glabrous; sheaths longer than the internodes, the uppermost elongate, prominently papillose-hispid with long spreading hairs; ligule 1 mm. long, firm, hispid-ciliate, the hairs up to 2 mm. long; blades 35-41 cm. long, 2.3-3.6 cm. wide, glabrous the margins very scabrous; panicle 40 cm. long, partly enclosed in the upper sheath, open at maturity; spikelets 4-4.5 mm. long on very scabrous pedicels 1-4 cm. long; first glume clasping, as long as the spikelet or nearly so, occasionally longer than the spikelets, acute or somewhat rounded papillose-roughened, strongly 5-nerved, bearing a few long hairs near the tip, and on the margins; second glume and sterile lemma equal, strongly 5-nerved, papillose-roughened; fruit 3.5 mm. long, striate, the margins of the lemma not inrolled, the summit somewhat crested.

Type in the U. S. National Herbarium, No. 1255492, collected on mountain slope below Macieiras, Serra de Itatiaia, Rio de Janeiro, Brazil, altitude 1000-1200 M., January 18, 1925, by Agnes Chase (No. 8342).

Additional specimens examined: Brazil: Paraná: Tres Barras, Dusén 17587; Santa Catarina: Alta Matador, Rio do Sul, R. Reitz 6101.

This species is allied with Panicum penicillatum Nees, which differs in having smaller, short-pedicellate spikelets, the first glume 3-nerved, and narrower, usually shorter blades.

Lorea

PANICUM FONTANALE Swallen, sp. nov.

Culmi erecti, 45-50 cm. alti, glabri; ligula deficiens; laminae usque ad 30 cm. longae, 3.5 cm. latae, ad basin angustatae, glabrae; spiculae 3.2 mm. longae, pedicellis spiculis multo longioris; gluma prima spicula $1/3$ brevior.

Perennial; culms erect, 45-50 cm. tall, glabrous; sheaths glabrous elongate extending nearly to the base of the panicle with a much reduced blade; ligule wanting; blades as much as 30 cm. long, 3.5 mm. wide, flat, gradually narrowed toward the base to the width of the sheath, glabrous, even on the margins; panicle 9 cm. long with spreading to reflexed few-flowered branches; spikelets 3.2 mm. long on pedicels much longer than the spikelet; first glume $2/3$ as long as the spikelet, subacuminate, glabrous or the keels somewhat scabrous toward the tip; second glume and sterile lemma equal, acute or subacute, 5-nerved, glabrous, the lemma with a very well developed staminate flower; fruit 2 mm. long, acute or subacuminate, white, glabrous.

Type in the U. S. National Herbarium, No. 2378641, collected "on top of waterfall," Steyermark Falls, on upper reaches of Río Tirica.....western part of Chimantá-tepuí, Bolívar, Venezuela, 1700-1750 M., July 3, 1953, by Julian A. Steyermark (No. 76005).

This species is apparently related to Panicum steyermarkii Swallen, but differs in having long attenuate blades, and larger and laxer panicles of smaller spikelets.

PANICUM LUTZII Swallen, sp. nov.

Culmi caespitiosi, rhizomatosi, 35-50 cm. alti, foliis basi aggregatis; ligula brevissima, ciliata; laminae 15-30 cm. longae, basi conduplicatae, usque ad 5 mm. latae; spiculae 1.8-2 mm. longae, pedicellis plerumque breviores; gluma prima spicula $1/3$ brevior, subacuta.

Culms caespitose, 35-50 cm. tall, glabrous, leaves crowded toward the base; sheaths glabrous, broad at the base, gradually narrowed toward the summit; ligule very short, ciliate; blades 15-30 cm. long, firm, more or less flexuous, erect, glabrous, conduplicate at the base, narrow, gradually wider, as much as 5 mm. wide; inflorescence 8-10 cm. long, about 1 cm. wide, the branches appressed, as much as 5 cm. long, naked at the base; spikelets 1.8-2 mm. long, glabrous, the pedicels usually shorter; first glume $2/3$ as long as the spikelet, subacute, 3-nerved; second glume and sterile lemma subequal, obtuse, 3-5-nerved, the lemma including a palea and staminate flower; fruit 1.6 mm.

long, elliptic, acute, brownish.

Type in the U. S. National Herbarium, No. 2240718, collected on Tijuca, Rio de Janeiro, Brazil, February 1914, by Adolpho Lutz (No. 687).

Dichotoma

PANICUM TELMATUM Swallen, sp. nov.

Culmi decumbentes, ramosi, pilosi vel papilloso-pilosi; ligula dense ciliata ca. 1 mm. longa; laminae usque ad 5 cm. longae, 8 mm. latae, acutae appressae, marginibus scabrae et papilloso-ciliatae; spiculae 2.9 mm. longae, sparse pubescentes vel pilosae; gluma prima 2 mm. longa, acuta, 3-nervia; fructus 2.4 mm. longus, minute striatus.

Perennial; culms decumbent spreading with ascending ends, freely branching, pilose or papillose-pilose; lower sheaths a little shorter than the internodes becoming more or less crowded toward the ends of the branches, pilose to nearly glabrous; ligula a dense line of hairs about 1 mm. long; blades as much as 5 cm. long, 8 mm. wide, acute, appressed, sparsely hispid on the upper surface, the margins scabrous and papillose-ciliate; panicles partly enclosed in the sheaths or shortly exserted, 3-4.5 cm. long, about 1 cm. wide, with few rather narrowly ascending few-flowered branches, the main axis and branches pilose; spikelets 2.9 mm. long, sparsely pubescent or pilose; first glume 2 mm. long, broadly triangular, acute or rounded, 3-nerved; second glume and sterile lemma equal just covering the fruit, many nerved; fruit 2.4 mm. long, yellowish, minutely striate roughened.

Type in the U. S. National Herbarium, No. 2182190, collected in burnt part of boggy central area, Serra do Sol, Bolívar, Venezuela, 2100 m., December 28, 1954, by Bassett Maguire & Celia K. Maguire (No. 40400).

Panicum telmatum appears to be somewhat related to P. latiglume Doell, but it is caespitose rather than creeping, with larger and longer blades, and usually larger panicles.

Ungrouped

PANICUM ITATIAIAE Swallen, sp. nov.

Culmi basi decumbentes, ramosi, 1.7 m. longi; vaginae internodiis longiores vel breviores, glabrae, marginibus papilloso-hispidae; ligula 0.3 mm. longa, minutissime ciliata; laminae 10-12 cm. longae, 10-12 mm. latae, subcordatae, glabrae, marginibus scabrae et papilloso-hispidae; panicula 15 cm. longa, ramis patentibus, paucifloris, glabris; spiculae 4-4.5 mm. longae, glabrae; gluma prima 3-5-nervis, angusta, acuta; gluma secunda et lemma sterile 11-13-nervia,

gluma fructu breior, lemma fructu longior; fructus 3.8 mm. longus, 1.6 mm. latus, fuscus, marginibus planis, extremitate cristula pubescente praeditus.

Culms widely spreading from a long decumbent base, rooting at the nodes, sparingly branching, 1.7 m. long; sheaths a little longer or shorter than the numerous internodes, glabrous on the back, papillose-hispid on the margins; ligule 0.3 mm. long, minutely ciliate; blades 10-12 cm. long, 10-12 mm. wide, subcordate, acuminate, glabrous on both surfaces, scabrous and papillose-hispid on the margins; panicle long-exserted, 15 cm. long, about as wide, the branches spreading, few-flowered, glabrous, the axis more or less glandular-spotted; spikelets 4-4.5 mm. long, glabrous; first glume narrow, acute, 3-5-nerved; second glume and sterile lemma 11-13-nerved, the glume a little shorter, the lemma a little longer than the fruit; fruit 3.8 mm. long, 1.6 mm. wide, brown, the margins not inrolled, with a small pubescent crest at the summit.

Type in the U. S. National Herbarium, No. 1255836, collected under bamboo on mountain slope below Macieiras, Serra de Itatiaia, Rio de Janeiro, Brazil, 1700-1800 m. altitude, January 18, 1925, by Agnes Chase (No. 8327).

PANICUM INFUSCUM Swallen, sp. nov.

Culmi erecti vel decumbentes, 30-60 cm. longi, plerumque multinodosi; laminae 6-9 cm. longae, 6-12 mm. latae, subacuminatae, dense pubescentes; spiculae 1.8 mm. longae, nervosae, glabrae; gluma prima spicula $1/3$ - $3/4$ brevior, enervis vel 9-nervis; fructus fuscus, lucidus, ellipticus, apiculatus.

Perennial?; culms erect from a decumbent base, rooting at the lower nodes, 30-60 cm. long, usually with many short internodes; sheaths about as long as the internodes, rather densely pilose, the hairs spreading, with a dense rim of hairs on the collar; blades 6-9 cm. long, the uppermost reduced, 6-12 mm. wide, subacuminate, softly and densely pubescent on both surfaces; panicles 4.5-8 cm. long, the branches spreading, the main axis and branches pubescent; spikelets 1.8 mm. long, strongly nerved, glabrous; first glume $1/4$ to $2/3$ as long as the spikelet, nerveless or with as many as 9 nerves; second glume about $3/4$ as long as the spikelets, 7-9-nerved, rounded; sterile lemma as long as the fruit, subacute, 9-nerved; fruit light brown, smooth and shining, elliptic, apiculate.

Type in the U. S. National Herbarium, No. 1448475, collected on steep shaded slope on trail to Tijuca, Guanabara, Brazil, altitude 700 m., April 28, 1930, by Agnes Chase (No. 12145).

PANICUM MULTINODOSUM Swallen, sp. nov.

Culmi erecti vel decumbentes, 55 cm. longi, nodis ca. 25; ligula 0.3-0.4 mm. longa; laminae 4.5-7 cm. longae, 7-11 mm. latae, subcordatae, dense pubescentes; spiculae 1.8-2 mm. longae, hirsutae; gluma prima spicula ca. 1/2 brevior, lata, 3-nervis; fructus fuscus tenuiter rugosus.

Perennial; culms erect to spreading, 55 cm. long, with about 25 nodes; sheaths all longer than the internodes, hirsute; ligule straight, 0.3-0.4 mm. long; blades 4.5-7 cm. long, 7-11 mm. wide, spreading, slightly asymmetrical, subcordate, finely and densely pubescent on both surfaces; panicle 12 cm. long with a few ascending to spreading few-flowered branches; spikelets 1.8-2 mm. long, hirsute; first glume a little more than half the length of the spikelet, broad, 3-nerved; second glume and sterile lemma obtuse, 5-nerved, the second glume shorter than the fruit; fruit light brown, ovate, acute, finely cross-wrinkled.

Type in the U. S. National Herbarium, No. 1612918, collected in open forest, Bragança, Pará, Brazil, June 27-29, 1934, by Jason R. Swallen (No. 5037).

The Serrata Group of Ichnanthus

Blades 4-5 mm. wide, about 30 cm. long; panicles lax, the pedicels slender, usually much longer than the spikelets..... 1. I. serratus

Blades 8-11 mm. wide, usually more than 50 cm. long; panicles stiff, the pedicels usually shorter than the spikelets.

Panicles large, open, 30 cm. long; blades ciliate for 15 cm. above the base.

2. I. neblinaensis

Panicles relatively small, usually narrow, not more than 20 cm. long.

Blades attenuate to a fine point, smooth and shining. Spikelets 3.4-3.6 mm. long.

3. I. longifolius

Blades acuminate, not shining.

Spikelets 3 mm. long, sparsely pilose with long hairs.

4. I. ephemeroblepharis

Spikelets 4-5 mm. long, glabrous.

Spikelets 5 mm. long; blades long-attenuate to the base; panicle branches spreading.

5. I. tectus

Spikelets 4 mm. long; blades narrowed but not long-attenuate to the base; panicle narrow, the branches ascending.

6. I. angustus

1. *ICHNANTHUS SERRATUS* Swallen, *Fieldiana* 28: 30.
1951.
Venezuela: Steyermark 58298.

2. *ICHNANTHUS NEBLINAENSIS* Swallen, sp. nov.

Culmi erecti, 1.35 m. alti, glabri; ligula ciliata 1 mm. longa; laminae usque ad 55 cm. longae, 8-11 mm. latae, firmae, glabrae, marginibus irregulatim et fortiter scabris; panícula 30 cm. longa, 10 cm. lata, ramis adscendentibus usque ad 15 cm. longis, dense scabris; spiculae 3.5 mm. longae, glabrae; gluma prima 2.5 mm. longa, acuta; fructus 3 mm. longus, acutus, alis ca. 1.5 mm. longis.

Perennial; culms erect, 1.35 m. tall, flattened, glabrous; lower sheaths much longer, the upper ones a little shorter than the internodes, glabrous or ciliate on one side; ligule a dense line of hairs about 1 mm. long; blades flat, elongate, as much as 55 cm. long, 8-11 mm. wide, firm, flat, glabrous on both surfaces, the margins ciliate for as much as 15 cm., the margins strongly and irregularly scabrous; panicle 30 cm. long, about 10 cm. wide, pyramidal, with ascending branches up to 15 cm. long, the branchlets spreading, the main axis, branches, and branchlets densely and finely scabrous; spikelets 3.5 mm. long, glabrous; first glume 2.5 mm. long, acute or rounded; second glume and sterile lemma equal, 5-nerved, the lemma with a well developed palea a little longer than the lemma; fruit 3 mm. long, elliptic, acute, straw-colored, the wings about half as long.

Type in the herbarium of the New York Botanical Garden, collected on west escarpment slopes of Cañon Grande east of Cumbre Camp, Cerro de la Neblina, Río Yatua, Territory of Amazonas, 1100-1300 meters, Venezuela, November 25, 1957, by Bassett Maguire, John J. Wurdack & Celia K. Maguire (No. 42239).

This species is allied to *I. tectus* Swallen and related species, but differs from all of them in the large open panicle and the long ciliate base of the blades.

3. *ICHNANTHUS LONGIFOLIUS* Swallen, *Fieldiana* 28: 29.
1951.
Venezuela: Steyermark 58020.

4. *ICHNANTHUS EPHEMEROBLEPHARIS* Black & Fróes, *Bol. Inst. Agro. Norte* 15: 5. 1948.
Brazil: Fróes 22898.

5. *ICHNANTHUS TECTUS* Swallen, *Mem. N. Y. Bot. Gard.* 9: 265. 1957.
Venezuela: Cowan & Wurdack 31139.

6. *ICHNANTHUS ANGUSTUS* Swallen, Mem. N. Y. Bot. Gard.
9: 266. 1957.
Venezuela: Phelps & Hitchcock 476.

A New Species of *Sacciolepis*

SACCIOLEPIS PUNGENS Swallen, sp. nov.

Culmi caespitiosi, erecti, 90 cm. alti; ligula 0.2 mm. longa, minute ciliata; laminae firmae, nervosae, planae, usque ad 25 cm. longae, 3 mm. latae, supra minute pubescentes; spiculae 1.8-2 mm. longae pedicellis pubescentibus; gluma prima spicula $1/3$ - $1/2$ brevior, acuta, 5-nervis; fructus 1-1.1 mm. longus, albus, nitidus, summo minute hispidulus.

Perennial; culms tufted, erect, 90 cm. tall, glabrous, with numerous short internodes toward the base; sheaths, at least the lower, much overlapping, glabrous; ligule 0.2 mm. long, minutely ciliate; blades firm, strongly nerved, flat below becoming involute toward the tip, as much as 25 cm. long, 3 mm. wide, minutely pubescent on the upper surface toward the base, otherwise glabrous; spikelets 1.8-2 mm. long, glabrous, minutely pubescent toward the tip, or glabrous, the pedicels usually shorter than the spikelets, pubescent with spreading hairs; first glume $1/2$ to $2/3$ as long as the spikelet, acute, 5-nerved; second glume and sterile lemma equal, strongly 5-7-nerved; fruit 1-1.1 mm. long, elliptic, white, smooth and shining, minutely hispidulous at the tip.

Type in the U. S. National Herbarium, No. 2208531, collected in marichal at northwest base of Cerro Gavilan (Cerro Carichana), Bolívar, Venezuela, 100 meters altitude, December 21, 1955, by John J. Wurdack & J. V. Monachino (No. 40894).

New Species of *Olyra*

OLYRA WURDACKII Swallen, sp. nov.

Culmi simplices, 3.3 m. alti, glabri, nodis barbatis pilis appressis; laminae 15-26 cm. longae, 5 cm. latae, glabrae; panícula 27 mm. longa, ramis numerosis, appressis, verticillatis; spiculae masculae 8-10 mm. longae, acuminatae vel attenuatae, glabrae, appressae; spiculae femineae 7-8 mm. longae, pilosae, glumis acuminatis, non aristatis; fructus 5 mm. longus, albus, lucidus.

Culms simple, 3.3 m. tall, glabrous, with dense bands of white appressed hairs at the nodes; sheaths all much shorter than the internodes, glabrous; blades 15-26 cm. long, about 5 cm. wide, rounded at the base, scarcely petiolate, with a few stiff hairs on the margins near the base, glabrous on both surfaces; panicle 27 cm. long, composed of numerous

appressed verticillate branches, making a dense mass of almost entirely staminate spikelets; branches 10-18 cm. long, ascending or appressed, densely villous in the axils; staminate spikelets 8-10 mm. long, acuminate or attenuate, glabrous; appressed; pistillate spikelets 2 or 3 at the ends of the branches, 7-8 mm. long, the glumes acuminate but not awned, pilose; fruit 5 mm. long, white, smooth and shining.

Type in the U. S. National Herbarium, Nos. 2307269 and 2307270, collected at edge of open rock on crystalline dome on right bank of Río Siapa just below Raudal Gallineta, Territory Amazonas, Venezuela, altitude 300-500 meters, July 21, 1959, by John J. Wurdack & L. S. Adderley (No. 43540).

OLYRA MARANONENSIS Swallen, sp. nov.

Culmi erecti, 85-90 cm. alti, glabri; laminae 19-22 cm. longae, 3-4 cm. latae, glabrae, nitidae; paniculae 13 cm. longae ramis erectis vel adscendentibus inferioribus usque ad 5 cm. longis; spiculae masculae 2.5-3.5 mm. longae, acuminatae, pilosae; spiculae femineae 10-13 mm. longae; gluma arista flexuosa 8-12 mm. longa; fructus 8 mm. longus, marginibus dense villosus.

Culms erect, 85-90 cm. tall, glabrous; lower sheaths distant, glabrous, much shorter than the internodes, the upper overlapping with well-developed blades; blades 19-22 cm. long, 3-4 cm. wide, asymmetrical oblique at the base, glabrous, glossy; panicles 13 cm. long, with slender erect or ascending branches, the lower as much as 5 cm. long; staminate spikelets 2.5-3.5 mm. long, acuminate or awn-pointed, pilose, distant and short-pedicelled on the longer branches, sometimes terminating a shorter branch; stamens 3, white, 2 mm. long; pistillate spikelets solitary on the ends of a few of the upper branches, 10-13 mm. long, the first glume merging into a flexuous awn 8-12 mm. long; fruit 8 mm. long, densely villous on the margins at the base, the margins near the summit less villous, but distinctly so; palea acuminate, as long as the lemma.

Type in the U. S. National Herbarium, No. 2382316, collected in rainforest on ridge crest of Quebrada Chuivi, valley of Río Marañón near Cascades de Mayasi, elevation 500-550 m., Amazonas, Peru, September 20, 1962, by John J. Wurdack (No. 1936).

OLYRA TAQUARA Swallen, sp. nov.

Culmi validi, erecti, ca. 2.5 m. alti, nodis ramosi; laminae 25-35 cm. longae, 6-7 cm. latae, subcordatae, petiolatae, glabrae, marginibus scabris; paniculae 12-17 cm. longae, ramis adscendentibus vel divergentibus, subverticillatis; spiculae masculae

8-10 mm. longae, breviaristatae; spiculae femineae 2-2.8 cm. longae; fructus 8 mm. longus, cylindricus, glabrous.

Perennial; culms stout, erect, about 2.5 m. tall, branching at the upper nodes; lower sheaths bladeless much shorter than the internodes with short stiff appressed hairs above the nodes, crowded upward; blades 25-35 cm. long, 6-7 cm. wide, somewhat cordate at the base, petiolate, glabrous on both surfaces, the margins very scabrous; panicles 12-17 cm. long, the branches stiffly ascending or spreading, roughly verticillate, the upper ones solitary, scattered; staminate spikelets appressed to branches, 8-10 mm. long including the short awn, glabrous, the stamens 4 mm. long; pistillate spikelets 2 or 3 at the ends of the branches, 2-2.8 cm. long including the awns, the body of the glume 8-12 mm. long; fruit about 8 mm. long, slender, cylindric, glabrous.

Type in the U. S. National Herbarium, No. 2434254, collected in swamp forest at Riberão Grande, Município Jataí, Goiás, Brazil, July 25, 1956, by A. Macedo (No. 4386).

Also collected in the same locality Macedo 4380. The second specimen is undoubtedly the same species but the blades are all much smaller, not more than 14 cm. long and 3 cm. wide.

A New Species of *Imperata*

IMPERATA FLEXUOSA Swallen, sp. nov.

Culmi erecti, 120 cm. alti, rhizomatibus prominentibus; laminae usque ad 80 cm. longae, 1 cm. latae, ad basim attenuatae, glabrae; panicula 55 cm. longa, erecta vel pendula, ramis in fasciculis remotis, flexuosis, inaequalis, 1-12 cm. longis basi nudis; spiculae 3-4 mm. longae; glumae et callus pilis 10-12 mm. longis.

Culms erect from deep prominent rhizomes, 120 cm. tall; lower sheaths becoming fibrous with age, the upper ones much longer than the internodes, glabrous or somewhat pilose near the summit; blades as much as 80 cm. long, attenuate, long-narrowed to the base, as much as 1 cm. wide, glabrous, the margins ciliate for as much as 10 cm.; panicle 55 cm. long, erect or nodding, the axis slender, the branches in distant groups, few-flowered, slender, flexuous, of unequal length, 1-2 cm. to as much as 12 cm. long, naked at the base, with a few long hairs in the axils of the branches and branchlets; spikelet 3-4 mm. long with hairs about 10-12 mm. long on the callus and glumes.

Type in the U. S. National Herbarium, No. 1913732, collected "En conucos. Kavanoyen. Selva de Oparuma. Guayana Venezolana" Venezuela, May 30, 1946, by T. Lasser (No. 1886).

Eriochrysis

Spikelets not crowded, not greatly obscured by the hairs.

Spikelets ovate-acute.

Panicles 8-14 cm. long, spikelike, the racemes appressed; spikelets 5-6 mm. long.

1. E. holcoides

Panicles 17-22 cm. long, not spikelike, the racemes ascending; spikelets 4-5 mm. long.

2. E. warmingiana

Spikelets usually obovate, rounded or blunt at the summit..... 3. E. laxa

Spikelets crowded, mostly obscured by the hairs.

Hairs of the spikelets light brown or tan; spikelets not glomerate.

Glumes or at least most of them irregularly lobed, obtuse, foliage glabrous.. 4. E. glabrifolia

Glumes acute; foliage densely appressed villous.

5. E. villosa

Hairs of spikelets dark brown; spikelets usually dense, glomerate..... 6. E. cayennensis

1. ERIOCHRYSIS HOLCOIDES (Nees) Kuhlmann. Comm. Linhas

Telegraph. Estrat. Matto Grosso 67: 89.

Annexo 5, Bot. 11: 89. 1922.

Saccharum holcoides Hack. in Mart. Fl. Bras.

2(3): 254. 1883.

Anatherum holcoides Nees, Agrost. Bras. 324. 1829.

Specimens examined: Brazil: Paraná: Pinhoes, Dusén 8927, 15820; Curitiba, Swallen 8526; Tabatinga, Hatschbach 6313. Santa Catarina: Santo Cecélia, Reitz & Klein 13480, 13505; Rio dos Patos, Lebon Regis, Reitz & Klein 13837; Matos Costa, Reitz & Klein 13720, 13742; Serra da Boa Vista, São José, Reitz & Klein 5417, 10247; Serra do Oratorio, S. Joaquim; Campo Alegre, Smith & Klein 7467; Reitz & Klein 5338, 10114; Campo dos Padres, Smith, Reitz & Klein 7764; Reitz 2710; Mafra, Smith & Klein 10668. Rio Grande do Sul: D. Petrolini, Swallen 7307; Vacaria, Swallen 8214; São Francisco de Paula, Rambo 54, 574.

2. ERIOCHRYSIS WARMINGIANA (Hack.) Kuhlmann. Comm.

Linhas Telegraph. Estrat. Matto Grosso 67: 29. 1912.

Saccharum warmingiana Hack. in Mart. Fl. Bras.

2(3): 254. 1883.

Specimens examined: Bolivia: Santa Cruz: Buena Vista, Steinback 7032. Brazil: Mato Grosso: Aquidauana, Chase 11063; Swallen 9533.

3. *ERIOCHRYSIS LAXA* Swallen, sp. nov.

Culmi caespitosi, erecti, 130 cm. alti, nodis pilosis; vaginae glabrae; ligula 1 mm. longa, minute ciliata; laminae planae, eae innovationum filiformes usque ad 45 cm. longae et 2 mm. latae, glabrae, eae culmorum usque ad 60 cm. longae et 4 mm. latae, superiores multo breviores usque ad 6 mm. latae, supra dense pilosa; inflorescentia 22 cm. longa, 2 cm. lata; spiculae sessiles ca. 4 mm. longae, obovatae, glabrae, marginibus pilis 3 mm. longis; gluma secunda angusta marginibus supra ciliata; lemma sterile hyalinum, marginibus pauciciliatum.

Culms densely tufted, erect, 130 cm. tall, glabrous, the nodes appressed-pilose; sheaths all longer than the internodes, glabrous; ligule about 1 mm. long, minutely erose or ciliate; blades of innovations as much as 45 cm. long, subfiliform below, sometimes broadened above to as much as 2 mm., glabrous, those of the culm as much as 60 cm. long and 4 mm. wide, the upper ones much shorter as much as 6 mm. wide, densely pilose on the upper surface; inflorescence 22 cm. long, 2 cm. wide, interrupted below, the axis and branches glabrous; sessile spikelets about 4 mm. long, usually obovate, the tip rounded, the margins bearing hairs as much as 3 mm. long, the back glabrous, papillate-roughened; second glume narrow, the margins ciliate in the upper half; sterile lemma hyaline, sparingly ciliate on the margins with relatively strong hairs.

Type in the U. S. National Herbarium, No. 1256173, collected in wet ground near streamlet, Lauras, Minas Gerais, Brazil, March 5, 1925, by Agnes Chase (No. 8729).

It is possible that this is the taxon described by Hackel as *Eriochrysis cayennensis* var. *laxiuscula*. The description is too insufficient to be sure of it, and no type was found in Europe by Mrs. Chase or Prof. Hitchcock. It seems better then, to describe it as a distinct species.

Additional material examined: Colombia: Mutis 5471. Bolivia: Santa Cruz, Steinback 6975 bis. Paraguay: Lacus Ypacaray, Hassler 12492; Posta Ibihená, Rojas 13307. Argentina: Prov. Corrientes: Estancia Santa Teresa, Petersen 1713; Prov. Misiones: Posadas, Ekman 526. Brazil: Paraná: Curitiba, Swallen 8513; Londrina, Swallen 8728; São Paulo: Pindorama, Viegas 3381; Pickel s.n.; Minas Gerais: Glaziou 17889a; Uberlandia, Chase 11254; Lavras, Chase 8729; Juiz de Fôro, Chase 8603; Goiás: Rio dos Bois, Chase 11675; Anapolis, Chase 11365; Santo Rita do Araguaya, Chase 12038, 12039; Rio Verde, Chase 12089; Mato Grosso: Dourados, Chase 10945, 10956; Campo Grande, Gehrt 114.

4. *ERIOCHRYSIS GLABRIFOLIA* Swallen, sp. nov.

Culmi dense caespitosi, erecti, ca. 90 cm. alti, glabri, nodis pubescentibus; vaginae glabrae vel summo pilosae; ligula ca. 1 mm. longa; innovationum laminae usque ad 40 cm. longae, 1-2 mm. latae, eae culmorum 4-6 mm. latae supra ligulam pilosae; inflorescentia 16 cm. longa, 5-10 mm. lata, densa, spiculae sessiles 3 mm. longae, obovatae; gluma prima dorso glabra, marginibus pauciciliata, summo dense hispida; spiculae pedicellatae ca. 1.8 mm. longae; lemma fertile ca. 2 mm. longum.

Perennial; culms densely tufted, erect, about 90 cm. tall, glabrous, the nodes appressed pubescent; sheaths longer than the internodes, rounded on the back, glabrous, or pilose near the summit; ligule 1 mm. long, short-pilose at the tip; blades of innovations as much as 40 cm. long, narrow, not more than 1 mm. wide or widened above to 2 mm., those of the culm not so narrow at the base, 4-6 mm. wide toward the ends, densely pilose above the ligule, otherwise glabrous; inflorescence partly enclosed in the sheath, 16 cm. long, 5-10 mm. wide, dense; sessile spikelets 3 mm. long, obovate; first glume glabrous on the back, more or less ciliate on the margins, with dense tuft of hairs at the tip; pedicellate spikelet about 1.8 mm. long, densely hairy at the tip and on the margins; fertile lemma about 2 mm. long.

Type in the U. S. National Herbarium, No. 1960865, collected in banhado, Estação Experimental, Ponta Grosso, Paraná, Brazil, January 28, 1946, by Jason R. Swallen (No. 8296).

Additional specimens examined: Brazil: Paraná: Guarapuava, Swallen 8803. Santa Catarina: Curitiba, Reitz & Klein 11806; Smith 11103; Indios, Smith 11220.

5. *ERIOCHRYSIS VILLOSA* Swallen, sp. nov.

Culmi dense caespitosi, erecti, ca. 1 m. alti, glabri, nodis villosis; vaginae dense villosae; ligula ca. 1 mm. longa; laminae planae, 14-30 cm. longae, 5-8 mm. latae, firmae, dense villosae, suprema reducta; inflorescentia 22 cm. longa, densa, axi et ramis villosis; spiculae 3-4 mm. longae; gluma prima marginibus villosa pilis 2-3 mm. longis; gluma secunda summo et marginibus pilosis; lemma fertile 2 mm. longum marginibus pauciciliatum.

Culms densely tufted, erect, about 1 m. tall, glabrous, the nodes distinctly appressed villous; sheaths densely ascending or appressed villous, usually longer, occasionally a little shorter, than the internodes; ligule about 1 mm. long, obscurely ciliate; blades flat, 14-30 cm. long, 5-8 mm. wide, firm, densely appressed-villous, the uppermost reduced;

inflorescence 22 cm. long, dense, somewhat interrupted below, the axis and branches appressed-villous; spikelets 3-4 mm. long, not more than 1 mm. wide; first glume villous on the margins, especially at the summit, the hairs 2-3 mm. long, the back glabrous; second glume pilose at the summit on the margins with a few long hairs intermixed; sterile lemma a little shorter than the glume, acute, hyaline pilose on the margins at the summit; fertile lemma 2 mm. long, sparsely ciliate on the margins.

Type in the U. S. National Herbarium, No. 1961568, collected in banhado, Rio Caçador, Santa Catarina, Brazil, January 21, 1946, by Jason R. Swallen (No. 8237).

Additional material examined: Brazil: Santa Catarina: Lages, Swallen 8125; Smith 12242; Reitz 6456. Rio Grande do Sul: Jaquirana, Rambo 52049; Cambara, Rambo 36476.

6. *ERIOCHRYSIS CAYENNENSIS* Beauv. Ess. Agrost. 8. pl. 4. f. 11. 1812.

This is the most widespread of all the species of *Eriochrysis*. It ranges from Mexico and the West Indies to Bolivia and Argentina. It is composed of several elements, none of which can be separated satisfactorily with the material available.

Erianthus

Nodes conspicuously bearded.

Glumes entirely glabrous; spikelets 3.5-4 mm. long; sterile lemma and lemma glabrous.

1. *E. asper*

Glumes villous across the back or ciliate on the margins only. Spikelets 6-8 mm. long; sterile lemma and lemma ciliate.

Glumes villous across the back; culms usually 2-3 m. tall; panicle large, dense, pale, many-flowered..... 2. *E. trinii*

Glumes ciliate on the margins; culms less than 2 m. tall, usually not much more than 1 m. tall; panicles small, relatively few-flowered, tinged with purple.

Sterile lemma and lemma ciliate, acute; blades narrow, not much widened above.

3. *E. purpureus*

Sterile lemma and lemma villous on the back, the sterile lemma awned; blades broadened above, as much as 14 mm. wide.

4. *E. biaristatus*

Nodes glabrous or only obscurely bearded, the hairs, if any, very short.

Panicles exserted.

Culms glabrous below the panicle.

5. E. angustifolius

Culms villous below the panicle.

1. E. asper

Panicles entirely or only partly included in the sheath; callus hairs longer than the spikelet.

Culms stout; inflorescence included only at the base; sterile lemma and lemma ciliate.

6. E. glabrinodis

Culms relatively slender; inflorescence usually entirely enclosed in the upper sheath; sterile lemma and lemma glabrous.

7. E. clandestinus

1. ERIANTHUS ASPER Nees, Agrost. Bras. 315. 1829.

Type: Brazil: "Habitat in ripa fluminis S. Francisci pone Salgado, et alibi in prov. Minarum."

2. ERIANTHUS TRINII Hack. in DC. Monogr. Phan. 6: 135. 1889.

E. saccharoides spp. genuinus var. trinii in Mart. Fl. Bras. 2(3): 258. 1883.

3. ERIANTHUS PURPUREUS Swallen, sp. nov.

Culmi plerumque ca. 1 m. alti, infra inflorescentia appresso-hispidi, nodis barbatis; laminae angustae; spiculae 7-8 mm. longae; gluma et lemmata marginibus ciliata.

Culms erect, usually about 1 m. tall, appressed-hispid below the inflorescence, the nodes bearded; blades narrow, not much widened above; inflorescence small exserted, usually purple, distinctly appressed-hispid; spikelets 7-8 mm. long, the glumes ciliate on the margins; sterile and fertile lemma ciliate, acute.

Type in the U. S. National Herbarium, No. 1960827, collected in banhado, near Curitiba, Paraná, Brazil, by Jason R. Swallen (No. 8573).

Additional specimens examined: Brazil: Paraná: Campo Largo, Swallen 8581; Curitiba, Swallen 8532; Mun. Cerro Azul, Hatschbach 8310; Banhado-Piroquara, Swallen 8653; Pirahy, Dusén (Mus. Nat. R. Janeiro 4274); Santa Catarina: Lages, Swallen 8177, 8086; Curitibanos, Klein 3346; Mun. Chapeco, Smith & Klein 11627; Mun. P. União, Smith & Reitz 8624. São Paulo: Campo Grande, Kuhlmann. Minas Gerais: Hargreaves, Chase 10257. Rio Branco: Serra Tepequem, Maguire & Maguire 40059.

4. ERIANTHUS BIARISTATUS (Hack.) Swallen, comb. nov.

E. saccharoides ssp. angustifolius var.

biaristatus Hack. in Mart. Fl. Bras. 2(3): 258. 1883.

Specimens examined: Brazil: Goiás: Chapadinha, Glaziou 22380. Paraná: Pinhães, Dusén 8919. Santa Catarina: Santa Cecilia, Reitz & Klein 14140. São Paulo: Fazenda Campinha, NW of Moji-Mirim, Eiten 1545. Bolivia: Nor Yungas, Hitchcock 22737; White 1208.

5. *ERIANTHUS ANGUSTIFOLIUS* Nees, Agrost. Bras. 316. 1829.

Type: "...ad flumen Rio Grande do Sul dictum prope fines regni Paraguayanani. (Sellow)..."

6. *ERIANTHUS GLABRINODIS* (Hack.) Swallen, comb. nov.

E. saccharoides ssp. *genuinus* var. *trinii* subv. *glabrinodis* Hack. in Mart. Fl. Bras. 2(3): 258. 1883.

E. trinii subv. *glabrinodis* Hack. in DC. Monogr. Phan. 6. 135. 1889.

Specimens examined: Brazil: Rio Grande do Sul: S. Leopoldo, Dutra 560; Passo Fundo, Fazenda da Brigada, Swallen 7781. São Paulo: Ypiranga, Usteri. Minas Gerais: Ouro Preto, Chase 9373; Juiz de Fôra, Chase 8604.

7. *ERIANTHUS CLANDESTINUS* Swallen, sp. nov.

Culmi graciles, glabri; inflorescentia in vagina inclusa; glumae villosae; lemmata sterile et fertile glabra.

Culms slender, glabrous; inflorescence included in the upper sheath; glumes villous across the back; sterile and fertile lemmas glabrous, entire.

Specimens examined: Brazil: Paraná: Ponta Grosso, Swallen 8467; Curitiba, Dusén 13843; Campo Grande, Dusén 4214. Santa Catarina: Bom Retiro, Reitz 2874; Porto União, Reitz & Klein 12828; Smith & Klein 10722, 12170; Curitibanos, Reitz & Klein 11783; Smith & Klein 12192; Campos Novos, Reitz & Klein 14658; Rio Caçador: Swallen 8255. Rio Grande do Sul: Porto Alegre, Rambo 41390; Beetle 1562; Pelotas, Sacco 313; Mun. Rio Pardo, Jurgens G63. Rio de Janeiro: Chase 8228; Lutzburg 9. Mato Grosso: Dourados, Chase 10968.

New Species of Trachypogon

- TRACHYPOGON RIGIDIFOLIUS* Swallen, sp. nov.

Culmi erecti, 75 cm. alti, glabri, rhizomatosi; ligula ca. 1 mm. longa; laminae involutae, erectae, attenuatae 12-18 cm. longae, dense hispidae; spicula fertilis 10 mm. longa, callo 3 mm. longo dense hispido; gluma prima brevihispida; arista 9-10 cm. longa, 2-geniculata, hispida pilis 1-1.5 mm. longis.

Perennial; culms erect from prominent rhizomes, 75 cm. tall, glabrous, the nodes short appressed hispid;

sheaths all longer than the internodes, appressed hispid; ligule inconspicuous, less than 1 mm. long; blade erect, curved, involute, attenuate, 12-18 cm. long, densely hispid on both surfaces, becoming flat with age as much as 3 mm. wide; fertile spikelet 10 mm. long, the callus 3 mm. long, densely hispid; first glume evenly hispid, the hairs short; awn 9-10 cm. long, 2-geniculate, hispid, the hairs 1-1.5 mm. long; staminate spikelet about 8 mm. long, hispid like the fertile spikelet.

Type in the U. S. National Herbarium, No. 1961900, collected on campo, Fazenda de Criação, Ponta Grossa, Paraná, Brazil, February 6, 1946, by Jason R. Swallen (No. 8488).

TRACHYPOGON DENSUS Swallen, sp. nov.

Culmi dense caespitosi, erecti, 60-90 cm. alti, nodis hispidis; ligula ca. 2 mm. longa; laminae involutae (vel planae), attenuatae, glabrae, 10-25 cm. longae, 2 mm. latae; racemus solitarius, 5-9 cm. longus; spicula fertilis 9 mm. longa, callo 2 mm. longo; gluma prima sparse pilosa vel hispida; arista 2.8-4 cm. longa, hispida pilis 1-1.5 mm. longis.

Perennial; culms densely tufted, erect, 60-90 cm. tall, glabrous, the nodes appressed hispid; sheaths mostly longer than the internodes, the upper ones much longer, glabrous or sparsely hispid near the summit; ligule inconspicuous, about 2 mm. long; blades mostly involute, or becoming flat with age, erect, attenuate, glabrous, 10-25 cm. long, 2 mm. wide; racemes solitary, erect, long-exserted, 5-9 cm. long; fertile spikelet 9 mm. long, dark brown, the callus 2 mm. long; first glume sparsely pilose or hispid; awn 2.8-4 cm. long, hispid to the second bend with hairs 1-1.5 mm. long; sterile spikelets 7 mm. long, sparsely pilose or hispid.

Type in the U. S. National Herbarium, No. 1961886, collected in campo, Fazenda de Criação, Lages, Santa Catarina, January 4, 1946, by Jason R. Swallen (No. 8139).

TRACHYPOGON PARVIFLORUS Swallen, sp. nov.

Culmi erecti, 60-70 cm. alti, nodis barbatis; ligula 3-10 mm. longa, decurrens; laminae angustae, rigidae, summo usque ad 3 mm. latae; racemi 1-3, flexuosi, 7-12 cm. longi; spicula fertilis 7.5 cm. longa, callo 2 mm. longo dense barbato; gluma prima hirsuta pilis usque ad 3 mm. longis; arista 4 cm. longa, gracilis, 2-geniculata, hispida.

Perennial; culms erect, 60-70 cm. tall, glabrous, the nodes bearded to almost glabrous; sheaths glabrous, sparsely hispid on the collar, the uppermost nearly bladeless; ligule 3-10 mm. long, decurrent;

blades narrow in the lower part, stiff and rigid, becoming flat, as much as 3 mm. wide toward the ends; inflorescence long-exserted, composed of 1-3 flexuous racemes 7-12 cm. long; fertile spikelet 7.5 mm. long, the callus 2 mm. long, densely barbate in the center; first glume conspicuously hirsute, the hairs longer near the summit, as much as 3 mm. long; awn 4 cm. long, slender, weakly 2-geniculate, the first two segments hispid, the terminal obscurely so; staminate spikelet 6 mm. long, the hairs not as long as on the fertile spikelet.

Type in the U. S. National Herbarium, No. 2011555, collected on dry plains, Itapicuru, Bahia, Brazil, October 1949, by G. Pinto (No. 0193).

New Species of Sorghastrum

SORGHASTRUM AMPLUM Swallen, sp. nov.

Culmi 1.4 m. alti, glabri; ligula 3-4 mm. longa, firma; laminae planae usque ad 60 cm. longae, 7 mm. latae, glabrae; inflorescentia 35 cm. longa, ramis adscendentibus usque ad 12 cm. longis, glabris; spiculae 6-6.5 mm. longae; gluma prima villosa, 9-nervis; lemma fertile angustissimum, obscure ciliatum, bifidum, arista 2-geniculata, 2.6 cm. longa, parte secunda villosa.

Perennial; culms 1.4 m. tall, glabrous, or obscurely pubescent at the nodes; sheaths glabrous, the lower shorter, the upper longer than the internodes; ligule 3-4 mm. long, firm; blades flat, as much as 60 cm. long, 7 mm. wide, glabrous; inflorescence 35 cm. long, the main axis glabrous or nearly so, with ascending branches, the lower ones as much as 12 cm. long, becoming gradually shorter to the tip of the inflorescence, glabrous, the pedicels obliquely jointed; spikelets light tan, 6-6.5 mm. long, the first glume 9-nerved, villous with white hairs, the second glume 5-nerved, glabrous; sterile lemma very thin, narrow, ciliate on the keels nearly to the base; fertile lemma very narrow, obscurely ciliate, bearing an awn from between two teeth, the awn 2-geniculate, 2.6 cm. long, distinctly pilose on the second segment; sterile pedicels $2/3$ - $3/4$ as long as the spikelet, very densely villous with white silky hairs.

Type in the U. S. National Herbarium, No. 1128238, collected on open hills, São João, São Paulo, Brazil, March 19, 1922, by E. W. D. Holway and Mary M. Holway (No. 1658).

This species is allied to Sorghastrum stipoides, but differs in having a much larger panicle, larger and narrower spikelets, and a much longer awn. The hairs on the sterile pedicel are much denser and more silky. One specimen matches the type almost exactly,

collected at Tremembe, São Paulo, by E. W. D. Holway and Mary M. Holway. The fact that these two specimens were collected at different localities and at widely separated times, points to their being a distinct taxa.

SORGHASTRUM CHASAE Swallen, sp. nov.

Culmi scandentes, 3 mm. longi, ramosi; ligula firma, 5 mm. longa; laminae 25-45 cm. longae, usque ad 2 cm. latae, scabrae, infra pubescentes, marginibus scabrissimae; inflorescentia 20-30 cm. longa, ramis adscendentibus summo hispidis; spiculae 4.5-5 mm. longae; gluma prima manifesto hispida, 9-nervis; lemma fertile, angustissimum, arista bigeniculata 2.5 cm. longa.

Annual?; culms clambering in small tree, 3 m. high, branching, rooting at the lower nodes, glabrous; sheaths all shorter than the internodes, glabrous; ligule firm, indurate, about 5 mm. long; blades 25-45 cm. long, as much as 2 cm. wide, finely scabrous on both surfaces, pubescent below, the margins very scabrous; inflorescence 20-30 cm. long, the branches ascending, not very dense, the tip of the branches and branchlets hispid; spikelets 4.5-5 mm. long, green, the first glume 9-nerved, conspicuously hispid, the second glume 5-nerved, glabrous; sterile lemma thin, hyaline, pilose on the margins; fertile lemma very narrow, glabrous, bearing a relatively stout 2-geniculate awn 2.5 cm. long.

Type in the U. S. National Herbarium, No. 1501345, collected in sandy cerrado, Santa Rita do Araguaya, Mato Grosso, Brazil, April 5-6, 1930, by Agnes Chase (No. 11861).

This species is related to *Sorghastrum scaberrima* as indicated by the hispid ends of the panicle branches, but differs in being much larger with broad flat blades and is apparently annual rather than perennial.

SORGHASTRUM FLEXUOSUM Swallen, sp. nov.

Culmi dense caespitosi, erecti, 80 cm. alti; ligule 2-3 mm. longa, decurrens; laminae usque ad 20 cm. longae, infra angustae, 3-4 mm. latae, attenuatae, tenuiter scabrae; inflorescentia ca. 20 cm. longa, ramis adscendentibus summo prominente hispidis; spiculae 4.5 mm. longae; gluma prima hispida, 6-nervis; lemma fertile marginibus minute ciliatum; arista 2-geniculata ca. 15 mm. longa.

Perennial; culms densely caespitose, erect, 80 cm. tall; sheaths all longer than the internodes, glabrous; ligule 2-3 mm. long, decurrent, firm; blades up to 20 cm. long, narrowed below, widened above to 3-4 mm., attenuate, smooth to the touch, but

finely scabrous on both surfaces and on the margins; inflorescence about 20 cm. long, the flexuous branches ascending, prominently hispid at the ends, rather loosely flowered, glabrous or nearly so in the axils; spikelets 4.5 mm. long, medium brown, the first glume hispid, 6-nerved, the second glume glabrous, 5-nerved; sterile lemma very thin, hyaline, minutely ciliate on the margins in the upper half; fertile lemma sparsely and minutely ciliate on the margins, bearing a 2-geniculate awn about 15 mm. long.

Type in the U. S. National Herbarium, No. 2252125, collected on campo, Fazenda Ernesto Schiede, Campo Alegre, Santa Catarina, Brazil, by R. Reitz & R. Klein (No. 5347).

The following specimens, although they are somewhat variable, apparently belong to this species: Brazil: Paraná: Guarapuava, Swallen 8862, 8900; Santa Catarina: Porto União, Smith & Klein 10771; Campo Alegre, Smith & Klein 7490, 8531; Lages, Swallen 8141; Smith & Klein 8131; Curitiba, Smith & Klein 8291; São Joaquin, Reitz & Klein 7416, 7454, 7763, 8156; Bom Retiro: Reitz & Klein 5485; Rio Grande do Sul: Vacaria, Herb. Bradeanum 21611.

SORGHASTRUM RIGIDIFOLIUM Swallen, sp. nov.

Culmi erecti, 1.5 m. alti, glabri; ligula firma, 1-3 mm. longa; laminae 25-30 cm. longae, 3 mm. latae, infra angustae, glabrae; inflorescentia 30 cm. longa, ramis flexuosis, glabris, paucifloris; spiculae 5.5-6 mm. longae; gluma prima sparse hispida, 9-nervis; lemma fertile angustissimum, bifidum, arista 2-geniculata 15 mm. longa.

Perennial; culms erect, 1.5 m. tall, glabrous; sheaths elongate, longer than the internodes, glabrous; ligule firm, indurate, 1-3 mm. long; blades 25-30 cm. long, firm, erect, narrowed below, thick, expanded above to 3 mm. wide, glabrous, obscurely scabrous on the margins; inflorescence about 30 cm. long, the slender branches flexuous, glabrous, or sparsely hispid, few-flowered, the axis pubescent or pilose at the nodes; spikelets light brown, 5.5-6 mm. long, the first glume sparsely hispid, 9-nerved, the second glume glabrous, 5-nerved; sterile lemma narrow, finely ciliate on the keels above; fertile lemma very narrow, with a stout, 2-geniculate awn 15 mm. long from between the teeth of a bifid apex.

Type in the U. S. National Herbarium, No. 2302971, collected in brushy savannas, Herradura, Pinar del Río, Cuba, by E. L. Ekman (Mus. Botan. Stockholm Plantae Indiae Occidentalis, No. 11603).

This species has been erroneously referred to *Sorghastrum stipoides* (H.B.K.) Hitchc. which grows in South America from Colombia to Brazil and

Argentina. It has denser, less flexuous panicles with smaller spikelets, and the awns are shorter, scarcely more than 1 cm. long. The tip of the panicle branches are also glabrous. All specimens from Cuba assigned to S. stipoides should be referred to S. rigidifolium.

SORGHASTRUM VIRIDE Swallen, sp. nov.

Culmi erecti, 125 cm. alti, glabri, nodis barbatis; ligula 3-4 mm. longa; laminae usque ad 40 cm. longae, 4 mm. latae, planae; inflorescentia 22 cm. longa, ramis brevibus ad basin floriferis; spicula 5.5-6 mm. longa; gluma prima 9-nervis, sparse villosa; lemma fertile angustum, bifidum; arista 15 mm. longa, 2-geniculata.

Perennial; culms erect, 125 cm. tall, glabrous, the nodes appressed-hispid; sheaths all longer than the internodes, the uppermost elongate, glabrous; ligule 3-4 mm. long, the uppermost reduced, firm, rigid, decurrent; blades as much as 40 cm. long, 4 mm. wide, flat, narrowed toward the base; inflorescence 22 cm. long, the short branches floriferous to the base, flexuous, glabrous at the summit; spikelets 5.5-6 mm. long, green, the first glume 9-nerved, sparsely villous, the second glume 5-nerved, glabrous, minutely ciliate on the inturned margins; sterile lemma minutely ciliate in the upper half; fertile lemma narrow, bifid, awned from between the teeth of a bifid apex, the awn 2-geniculate about 15 mm. long; anthers 3 mm. long.

Type in the U. S. National Herbarium, No. 2378565, collected in open sedge meadow, Campos das Sete Lagoas, Municipio de Joji-Guaçu, São Paulo, Brazil, September 20, 1960, by George Eiten & Liene T. Eiten (No. 2336).

Possibly belonging to the same taxa are one specimen collected at Lapa, Paraná (Swallen 8617) and another at Lages, Santa Catarina (Smith 12243).